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North Korea

The Democratic Peoples Republic of Korea (North Korea) occupies a strategic location bordering China, South Korea, and Russia. In 1994, North Korea signed an agreement sponsored by the United States, Japan, and South Korea to halt its graphite technology nuclear program in exchange for two light water nuclear reactors. In the meantime, the United States is supplying fuel oil for use in electric power generation until the new reactors are completed.

Note: Information contained in this report is the best available as of September 2001 and can change.



GENERAL BACKGROUND

North Korea's economy, which remains under tight state control (collectivized agriculture and state-owned companies account for about 90% of all economic activity) grew by 1.3% in 2000, after growing 6.2% in 1999, according to estimates by South Korea's central bank, despite a drop in agricultural production. This followed a steady economic contraction from 1990 through 1998. North Korea's heavy industry has been affected by a severe energy shortage, which has forced production cutbacks at some plants.

North Korea's communist ideology has been based on the concept of "juche," or self-reliance. Severe economic problems have, however, forced the country to accept international food aid and embark on a

series of limited market reforms. Widespread famine in North Korea has reportedly killed hundreds of thousands of people - possibly up to 2 million. Several governments, including the United States, have provided funding to the United Nations' World Food Program (WFP) for emergency food aid to North Korea.

North Korea has permitted a small amount of foreign investment in recent years. In April 1998, North Korea asked the World Bank for guidance on establishing a market economy. North Korea also has established a free trade zone in Rajin-Sonbong, near the northern borders with China and Russia. Plans also have been under consideration for other such "bonded processing" zones, including one at Kaesong near the Demilitarized Zone (DMZ), but these have been held up by questions about the availability of electricity, among other issues.

North Korean-South Korean Relations

South Korean President Kim Dae Jung has called for increased contact and trade with North Korea. This is in line with his "sunshine policy" of pursuing increased contacts with the North.

From June 13th to 15th, 2000, the leaders of the two Koreas held their first summit meeting in Pyongyang. The summit led to a joint statement by the two leaders which supported, in general terms, the goal of eventual reunification of the two Korean states, reunification of families divided since the Korean War, and economic cooperation. A planned followup visit to South Korea by North Korean leader Kim Jong-Il, however, has been repeatedly delayed.

Most importantly for North Korea's energy sector, a thaw in relations with South Korea could potentially allow flows of aid from the South Korean government and investment from South Korean companies. Construction of power plants and electricity transmission infrastructure is considered one of the more likely areas of outside investment, as well as oil exploration. Several legal issues, including dual taxation, need to be resolved in order to facilitate foreign investment in North Korea.

United States Economic Sanctions

The United States announced on June 19, 2000 that it was easing some of the economic sanctions which have been in place with North Korea under the Trading With the Enemy Act since the start of the Korean War in 1950. American businesses will now be allowed to trade with North Korea. Licenses are still required from the Treasury Department's Office of Foreign Assets Control (OFAC) for many transactions, and sales of military and "dual-use" items are still restricted. (See the [OFAC Fact Sheet on North Korea Sanctions](#) for more information.) The designation of North Korea as a state supporter of terrorism by the United States also effectively precludes lending by international financial institutions such as the World Bank.

DOMESTIC ENERGY RESOURCES

North Korea relies on two domestic sources of commercial energy -- coal and hydropower -- for most of its energy needs. In 1999, coal accounted for almost 77% of primary energy consumption and hydropower for more than 13%.

North Korea's electric generating capacity is split nearly evenly between coal-fired thermal plants and hydroelectric plants. In 1999, hydroelectric power plants generated about 65% of North Korea's electricity and thermal plants about 35%. The country's thermal generating capacity is underutilized due to a lack of fuels. The country's total electricity consumption in 1999 was only 55% of what it had been in 1991.

As a result of an electricity shortage, North Korea has resorted to a rationing system. The country often experiences blackouts for extended periods of time, and power losses due to an antiquated transmission grid are high. Over the last few years, a lack of adequate rainfall and snowfall has presented problems for the country's hydroelectric generation, and many hydroelectric facilities are believed to be out of operation due to flood damage from major flooding in 1996.

The prospect of South Korean help for North Korea's electricity shortage was discussed at the June 2000 summit meeting, and North Korea has since been urgently seeking immediate assistance. A linkage between the electric grids of the two Koreas is one possibility, but it would be of limited immediate value due to the North's poor transmission infrastructure. Technical issues, such as the fact

that South Korea is on a 60 Hz transmission standard while the North is on a 50 Hz standard, also present serious obstacles.

Another possibility is South Korean investment in thermal power plants in North Korea. South Korea might also back projects aimed at increasing generation capacity at North Korea's hydroelectric dams and improving the efficiency of the electric transmission grid.

Problems with the North Korean coal industry are closely related to the problem with electricity supply. Coal-fired power plants have been running well under capacity in recent years, due in part to problems with rail transportation of coal. Investment in improved railroad equipment could help increase electricity production.

PETROLEUM

North Korea lacks domestic petroleum reserves, but the West Korea Bay may contain hydrocarbon reserves, as it is considered to be a geological extension of China's Bohai Bay. Sweden's Taurus Petroleum holds an oil exploration concession for two blocks, B and C, off the west coast of North Korea. Britain's Soco International holds the concession for Block A. Initial seismic surveys conducted by Taurus have identified possible oil-bearing geological structures. The two companies have held separate discussions with South Korea's Korean National Oil Company (KNOC) and Hyundai about possibly forming a consortium for joint exploration of the areas. Australia's Beach Petroleum also holds a concession for one block off the east coast of North Korea, which is considered less promising. The Japanese firm Petrex also holds a concession for exploration in the Sohan Bay.

In the meantime, North Korea must import all of the oil it consumes. Oil accounts for about 10% of total North Korean primary energy consumption, and is mostly limited to non-substitutable uses such as motor gasoline, diesel, and jet fuel. With the exception of the heavy fuel oil being provided under the nuclear agreement cited below, most petroleum is imported as crude oil and processed at domestic refineries. Under the 1994 "Agreed Framework," the United States assumed responsibility for providing 500,000 metric tons (approximately 3.3 million barrels) of heavy fuel oil annually through Korean Peninsula Energy Development Organization (KEDO).

Natural Gas Transportation

South Korea has held discussions with China, Russia, and BP Amoco about the possibility of importing natural gas from Russia's huge Kovykta gas field near Irkutsk. While China would be a major importer of gas through the pipeline, the project could be made more economical by adding a link to South Korea, which currently gets the vast majority of its natural gas by tanker as liquefied natural gas (LNG). North Korea is one possible route for the pipeline link to South Korea, and would be less costly than the subsea alternative.

NUCLEAR ENERGY

North Korea's nuclear program is a major concern for regional security, since its graphite reactor technology produces fissionable materials which can be used in nuclear weapons. North Korea withdrew from the Nuclear Non-Proliferation Treaty in 1993, and periodically has refused to cooperate with International Atomic Energy Agency inspection programs.

Under the Agreed Framework negotiated with the United States in 1994, North Korea agreed to freeze its nuclear program in exchange for two new pressurized light-water reactors (which are considered less capable of producing weapons-grade plutonium) and 500,000 metric tons per year (about 3.3 million barrels) of heavy fuel oil to meet its energy needs until the first new reactor becomes operational. KEDO, an international consortium led by the U.S. government (with South Korea, Japan, the European Union, and others), was established to implement the agreement. The European Union joined KEDO in September 1997.

Japan signed a contract in May 1999 committing to provide its \$1 billion contribution to KEDO to fund the new light-water reactors, an action which had been delayed by North Korea's missile test in August 1998. The project is expected to cost a total of \$4.6 billion, with South Korea providing the greatest share of funding at \$3.2 billion. The United States and the European Union also have pledged to contribute funds.

Construction of the light water reactors is to be performed under a turnkey contract with KEPCO, which was awarded in December 1999. Initial site preparation work has begun. The project has faced many delays, and the completion date for the first reactor has been pushed back to at least 2008, from an original completion date of 2003. One hurdle the project had faced was the issue of indemnity for potential liabilities created by the plant. General Electric had originally been chosen to supply the generators, but pulled out of the project when the issue was not resolved to its satisfaction. In January 2001, it was announced that a consortium of Japanese firms, led by Hitachi and Toshiba, would supply the generators. Initial excavation work is to begin at the construction site in mid-September 2001.

COUNTRY OVERVIEW

Head of State: Kim Jong Il (Chairman, National Defense Commission)

Independence: September 9, 1948

Population (2000E): 21.7 million

Location/Size: Eastern Asia/120,540 sq. kilometers (46,800 sq. miles), about the size of Pennsylvania

Major Cities: Pyongyang (capital), Hamhung, Chongjin

Language: Korean

Ethnic Groups: Korean

Religions: Buddhism, Christianity, Chundo Kyo

Defense (6/98): Army, (923,000); Air Force, (85,000); Navy, (46,000); security/border troops, (115,000); workers' and peasants' militia (Red Guard), 3.8 million

ECONOMIC OVERVIEW

Currency: 100 Chon = 1 Won

Official Exchange Rate (9/01): US\$1 = 2.20 Won

Gross Domestic Product (GDP-Purchasing Power Parity) (1999E): \$22.6 billion

Real GDP Growth Rate (2000E): 6.2% (Central Bank of South Korea estimate)

External Debt (1996E): \$12 billion

Exports (1998E): \$680 million

Imports (1998E): \$954 million

Major Import Products: Petroleum, grain, coking coal, machinery and equipment, and consumer goods

Major Export Products: Minerals, metallurgical products, agricultural and fishery products, manufactured goods (including armaments)

Trading Partners: China, Japan, Russia, Germany, Singapore, South Korea, Hong Kong

ENERGY OVERVIEW

Minister of the Power Industry: Yi Chi-chan

Minister of the Atomic Energy: Choe Hak-Kun

Minister of the Coal Industry: Kim Ki Kyong

Oil and Natural Gas Production/Reserves: None

Oil Consumption (1999E): 72,000 barrels per day (bbl/d)

Crude Oil Refining Capacity (1/1/01E): 71,000 bbl/d

Recoverable Coal Reserves (12/31/96): 661 million short tons

Coal Production (1999E): 85.5 million short tons

Coal Consumption (1999E): 87.6 million short tons

Electric Generating Capacity (1/1/99E): 10 gigawatts (about 50% hydropower)

Electricity Generation (1999E): 28.6 billion kilowatthours

Major Ports: Chongjin, Hamhung, Nampo

ENVIRONMENTAL OVERVIEW

Minister of Land & Environment Protection: II-Son Chang

Total Energy Consumption (1999E): 1.5 quadrillion Btu* (0.4% of world total energy consumption)

Energy-Related Carbon Emissions (1999E): 33.4 million metric tons of carbon (0.54% of world total carbon emissions)

Per Capita Energy Consumption (1999E): 64.2 million Btu (vs U.S. value of 355.8 million Btu)

Per Capita Carbon Emissions (1999E): 1.5 metric tons of carbon (vs U.S. value of 5.5 metric tons of carbon)

Energy Intensity (1997E): 71,200 Btu/\$1990 (vs U.S. value of 13,900 Btu/\$1990)**

Carbon Intensity (1997E): 1.7 metric tons of carbon/thousand \$1990 (vs U.S. value of 0.22 metric tons/thousand \$1990)**

Sectoral Share of Energy Consumption (1998E): Industrial (70.9%), Transportation (28.7%), Residential (0.4%), Commercial (0.0%)

Sectoral Share of Carbon Emissions (1998E): Industrial (80.3%), Transportation (19.3%), Residential (0.4%), Commercial (0.0%)

Fuel Share of Energy Consumption (1999E): Coal (76.5%), Oil (10.1%), Natural Gas (0.0%)

Fuel Share of Carbon Emissions (1999E): Coal (91.3%), Oil (8.7%), Natural Gas (0.0%)

Renewable Energy Consumption (1998E): 249.5 trillion Btu* (7% decrease from 1997)

Status in Climate Change Negotiations: Non-Annex I country under the United Nations Framework Convention on Climate Change (ratified December 5th, 1994). Not a signatory to the Kyoto Protocol.

Major Environmental Issues: Localized air pollution attributable to inadequate industrial controls; water pollution; inadequate supplies of potable water.

Major International Environmental Agreements: A party to the Antarctic Treaty, Biodiversity, Climate Change, Environmental Modification, Ozone Layer Protection and Ship Pollution. Has signed, but not ratified, the Antarctic-Environmental Protocol and Law of the Sea.

* The total energy consumption statistic includes petroleum, dry natural gas, coal, net hydro, nuclear, geothermal, solar, wind, wood and waste electric power. The renewable energy consumption statistic is based on International Energy Agency (IEA) data and includes hydropower, solar, wind, tide, geothermal, solid biomass and animal products, biomass gas and liquids, industrial and municipal wastes. Sectoral shares of energy consumption and carbon emissions are also based on IEA data.

**GDP based on EIA International Energy Annual 1999

Sources for this report include: The Bank of Korea (South Korea); Chosun Ilbo; CIA World Factbook 1999; Dow Jones News Wire service; Economist Intelligence Unit ViewsWire; Energy Compass; Hart's Asian Petroleum News; Korea Herald; Korea Times; Lloyds List; Los Angeles Times; U.S. Energy Information Administration; U.S. Department of State; Reuters News Wire; Washington Times.

Links

For more information on North Korea, please see these other sources on the EIA web site:

[EIA - Country Information on North Korea](#)

Links to other U.S. government sites:

[CIA World Factbook - North Korea](#)

[U.S. Department of Energy - Office of Fossil Energy - North Korea](#)

[U.S. Treasury Department - Office of Foreign Assets Control](#)

[U.S. State Department - Consular Information Sheet - North Korea](#)

[Library of Congress Country Study on North Korea](#)

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[Korean Peninsula Energy Development Organization \(KEDO\)](#)

[North Korean Subject Guide](#) at the University of Oregon

[North Korea WWW Virtual Library](#)

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